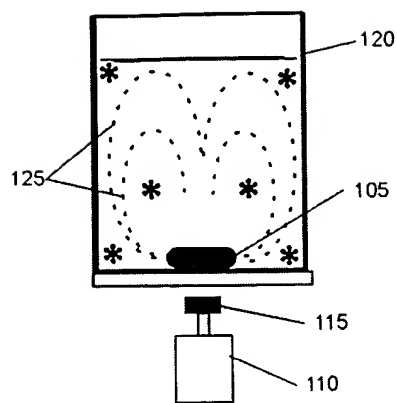
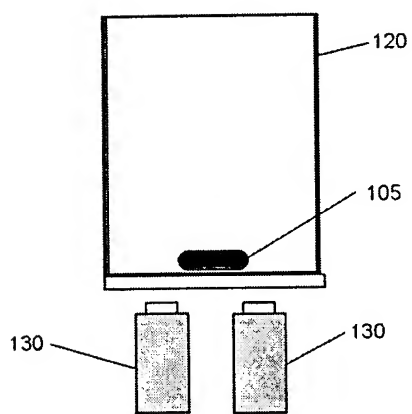


**FIGURE 1A  
(PRIOR ART)**

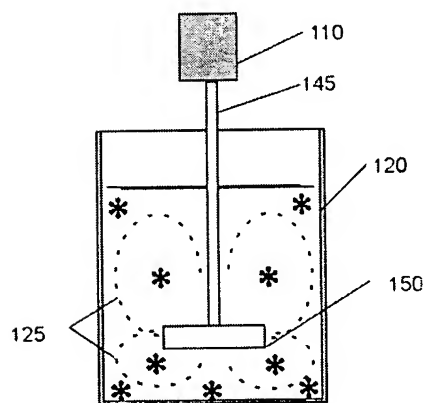


**FIGURE 1B  
(PRIOR ART)**

**\* AREAS OF INCOMPLETE STIRRING**



**FIGURE 1C  
(PRIOR ART)**



**FIGURE 1D  
(PRIOR ART)**

**\* AREAS OF INCOMPLETE STIRRING**

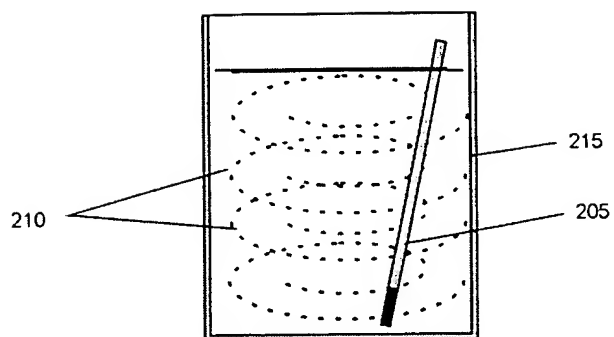


FIGURE 2A

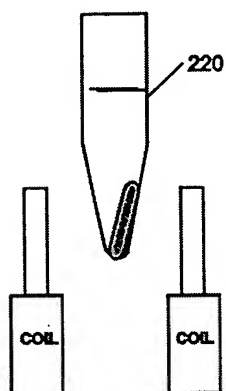


FIGURE 2B

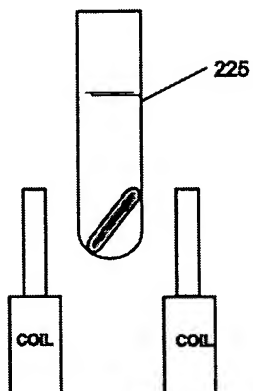


FIGURE 2C

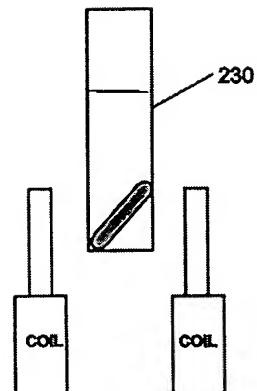


FIGURE 2D

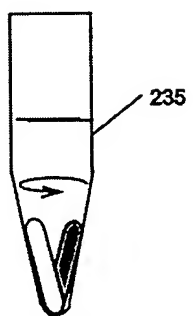


FIGURE 2E

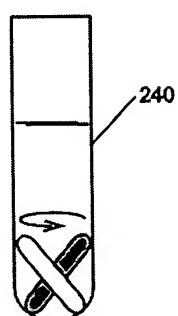


FIGURE 2F

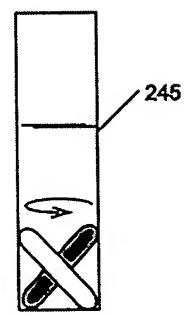


FIGURE 2G

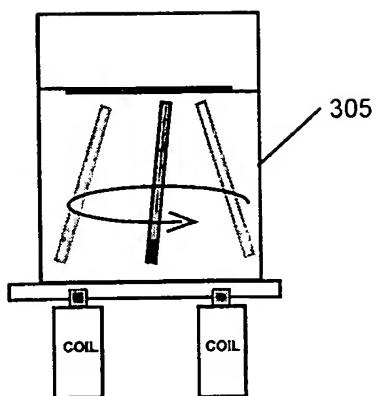


FIGURE 3A

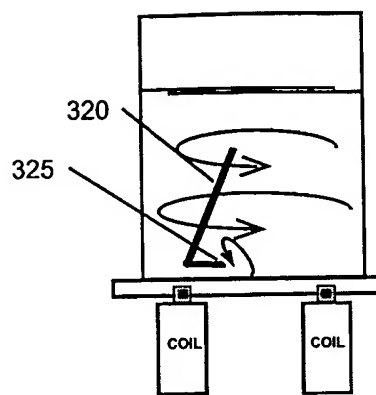


FIGURE 3C

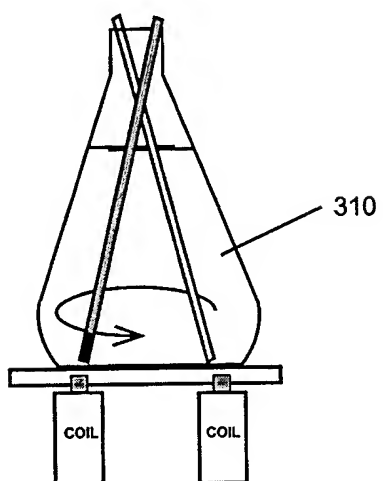


FIGURE 3B

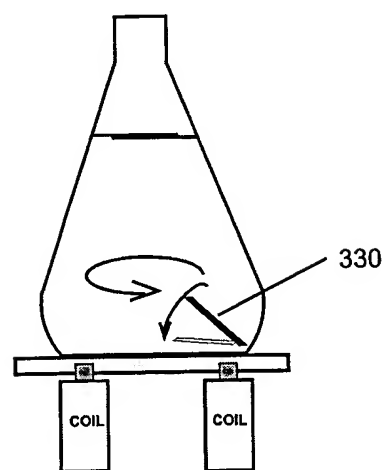


FIGURE 3D

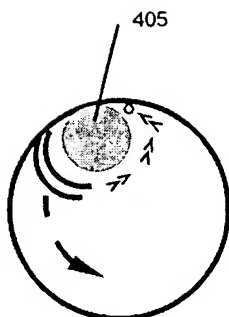


FIGURE 4A

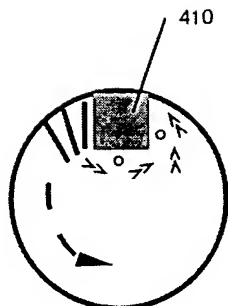


FIGURE 4B

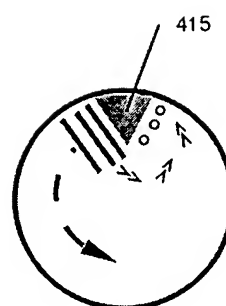


FIGURE 4C

SYMBOL KEY:

\\ FRONTAL WAVE

○ NEGATIVE PRESSURE

>> LIQUID FLOW

↻ BAR ROTATION

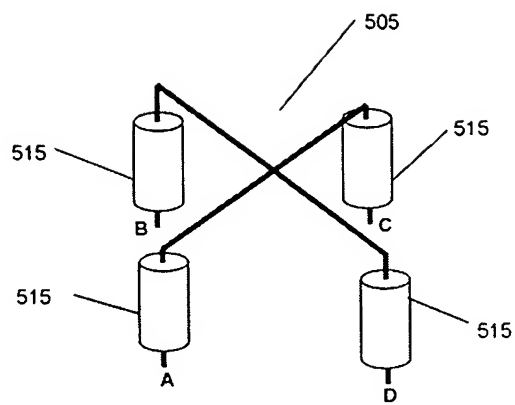


FIGURE 5A

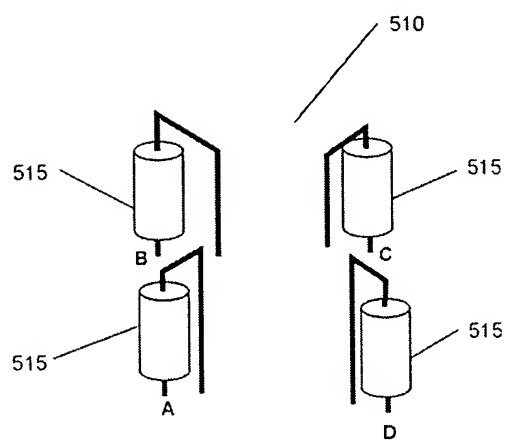


FIGURE 5B

In all configurations, coils A and C, B and D oppose each other.

Full Power, Single Step (centered magnet)

| Rotation Angle | Coil A |   | Coil B |   | Coil C |   | Coil D |   |
|----------------|--------|---|--------|---|--------|---|--------|---|
| 0              | +      | - |        |   | -      | + |        |   |
| 90             |        |   | +      | - |        |   | -      | + |
| 180            | -      | + |        |   | +      | - |        |   |
| 270            |        |   | -      | + |        |   | +      | - |

**FIGURE 6A**

Full Power, Single Step (magnet along wall of vial)

| Rotation Angle | Coil A |   | Coil B |   | Coil C |   | Coil D |   |
|----------------|--------|---|--------|---|--------|---|--------|---|
| 0              | +      | - |        |   |        |   |        |   |
| 90             |        |   | +      | - |        |   |        |   |
| 180            |        |   |        |   | +      | - |        |   |
| 270            |        |   |        |   |        |   | +      | - |

**FIGURE 6B**

Full Power, Half Step (centered magnet)

| Rotation Angle | Coil A |   | Coil B |   | Coil C |   | Coil D |   |
|----------------|--------|---|--------|---|--------|---|--------|---|
| 0              | +      | - |        |   | -      | + |        |   |
| 45             | +      | - | +      | - | -      | + | -      | + |
| 90             |        |   | +      | - |        |   | -      | + |
| 135            | -      | + | +      | - | +      | - | -      | + |
| 180            | -      | + |        |   | +      | - |        |   |
| 225            | -      | + | -      | + | +      | - | +      | - |
| 270            |        |   | -      | + |        |   | +      | - |
| 315            | +      | - | -      | + | -      | + | +      | - |

FIGURE 7A

Full Power, Half Step (magnet along wall of vial)

| Rotation Angle | Coil A |   | Coil B |   | Coil C |   | Coil D |   |
|----------------|--------|---|--------|---|--------|---|--------|---|
| 0              | +      | - |        |   |        |   |        |   |
| 45             | +      | - | +      | - |        |   |        |   |
| 90             |        |   | +      | - |        |   |        |   |
| 135            |        |   | +      | - | +      | - |        |   |
| 180            |        |   |        |   | +      | - |        |   |
| 225            |        |   |        |   | +      | - | +      | - |
| 270            |        |   |        |   |        |   | +      | - |
| 315            | +      | - |        |   |        |   | +      | - |

FIGURE 7B

Sinusoidal Drive (centered magnet)

| Rotation<br>Angle $\emptyset$ | Coil A<br>$\sin \emptyset$ | Coil B<br>$\sin (\emptyset - 90)$ | Coil C<br>$\sin (\emptyset - 180)$ | Coil D<br>$\sin (\emptyset - 270)$ |
|-------------------------------|----------------------------|-----------------------------------|------------------------------------|------------------------------------|
| 0                             | 0                          | Min                               | 0                                  | Max                                |
| 45                            | .707                       | .707                              | -.707                              | .707                               |
| 90                            | Max                        | 0                                 | Min                                | 0                                  |
| 135                           | .707                       | .707                              | .707                               | -.707                              |
| 180                           | 0                          | Max                               | 0                                  | Min                                |
| 215                           | -.707                      | .707                              | .707                               | .707                               |
| 270                           | Min                        | 0                                 | Max                                | 0                                  |
| 315                           | .707                       | -.707                             | .707                               | .707                               |

Max = maximum positive drive level possible.

Min = maximum negative drive level possible.

**FIGURE 8**



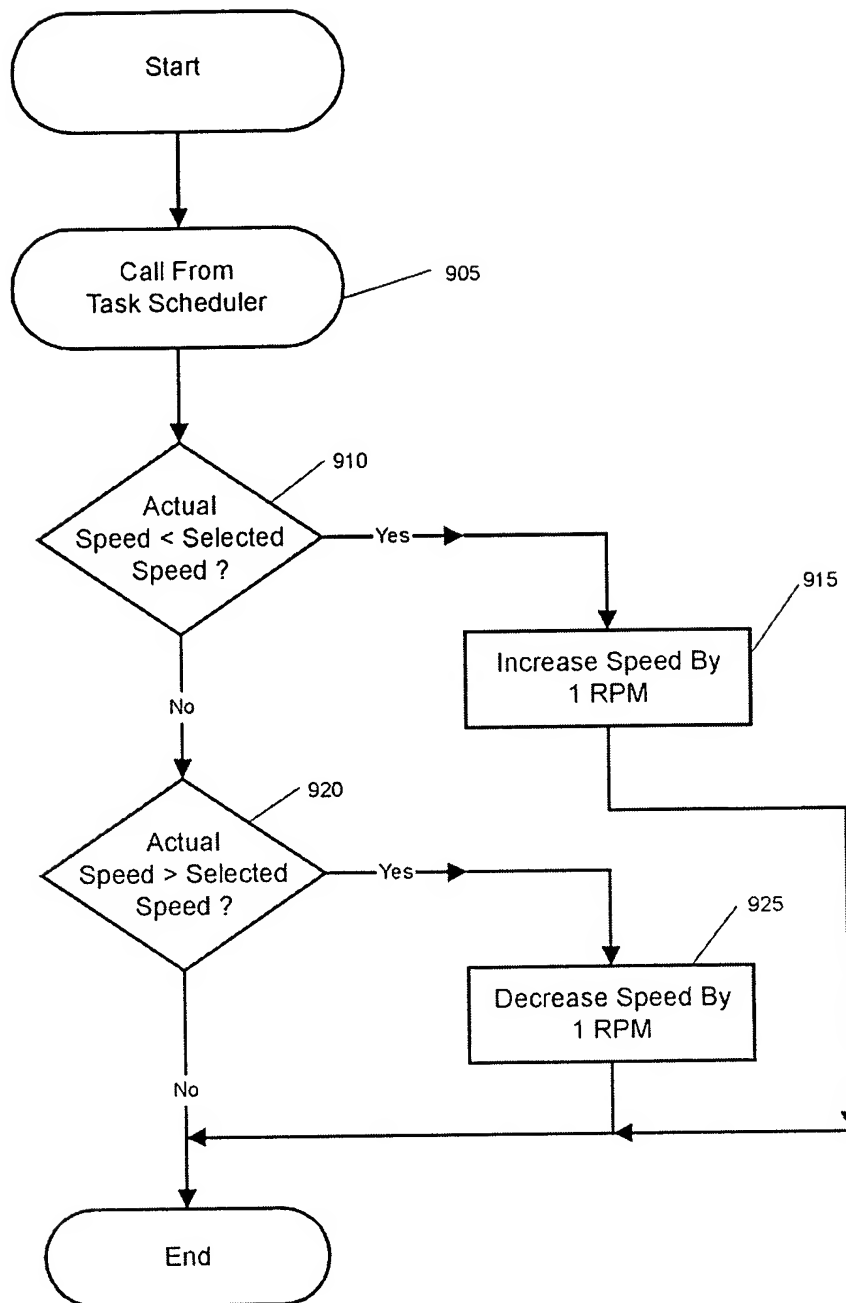


FIGURE 9

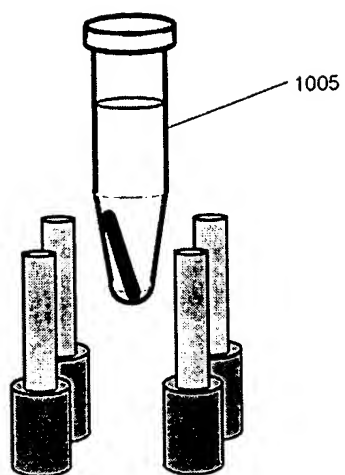


FIGURE 10A

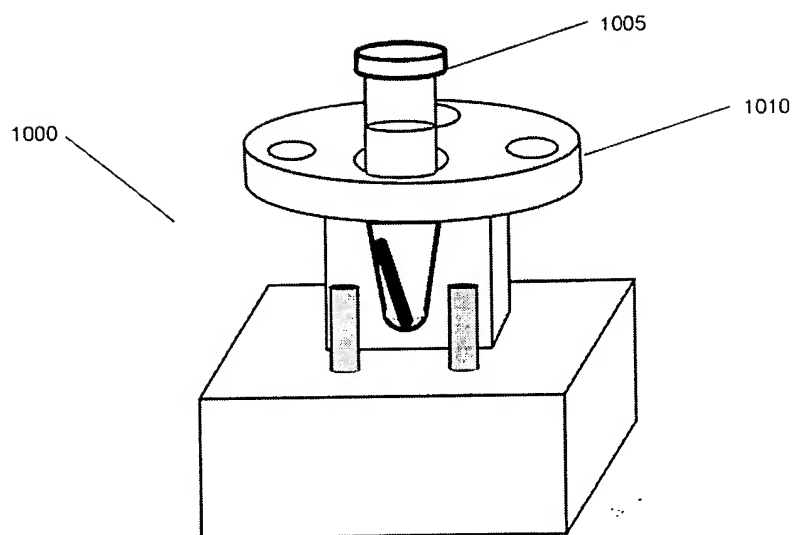


FIGURE 10B

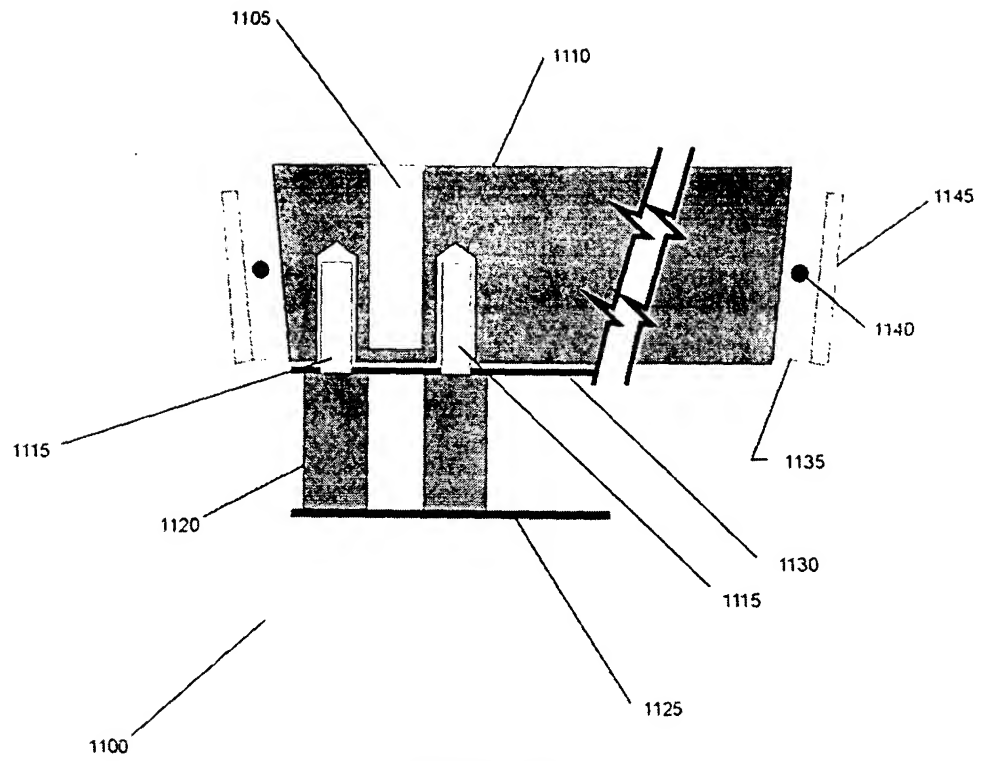


FIGURE 11A

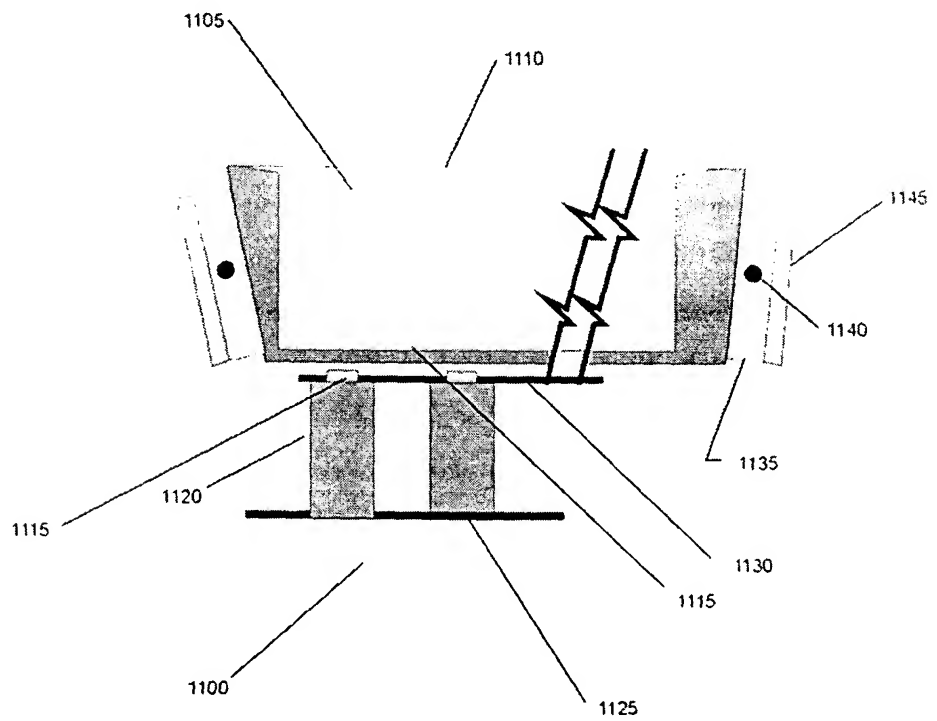


FIGURE 11B

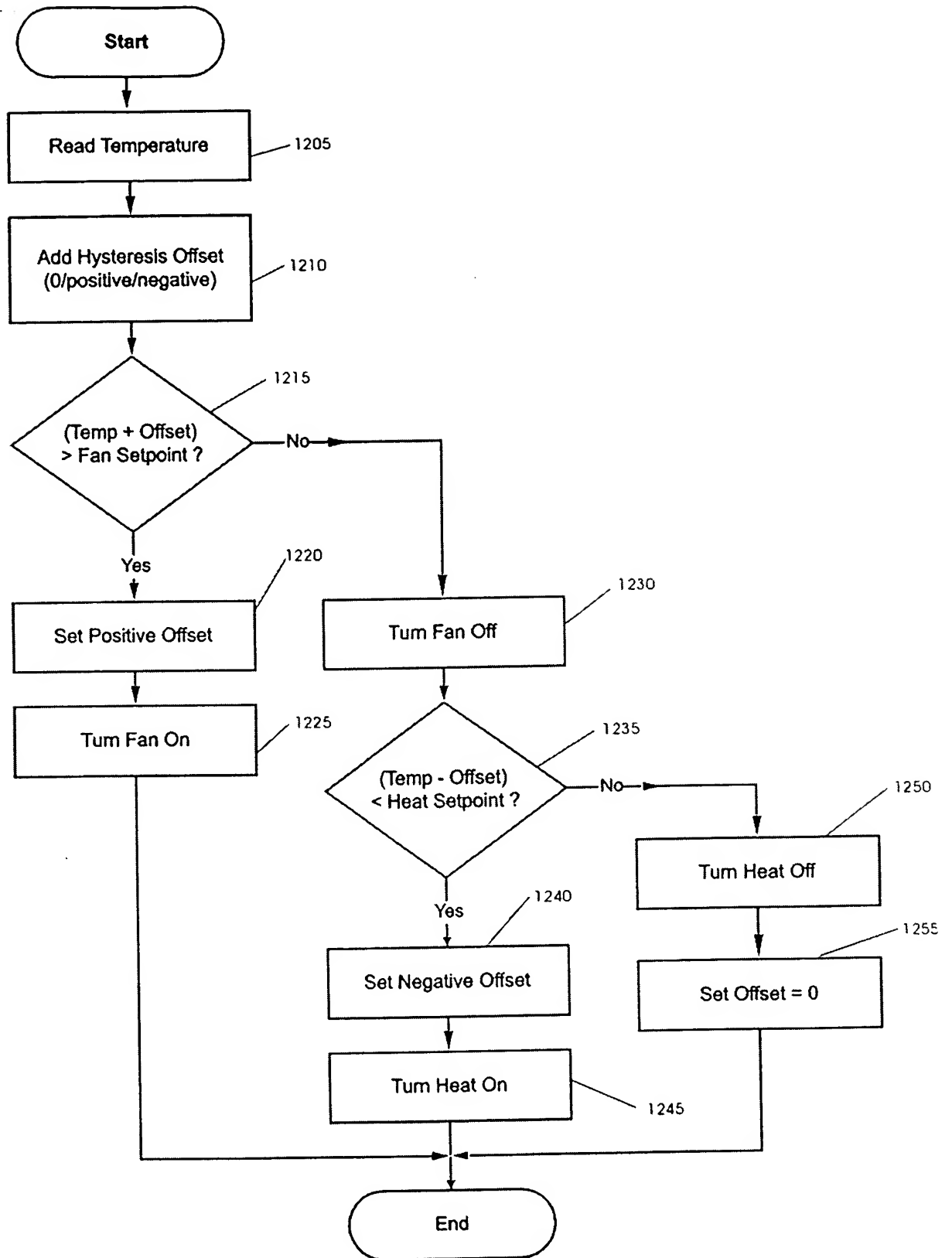
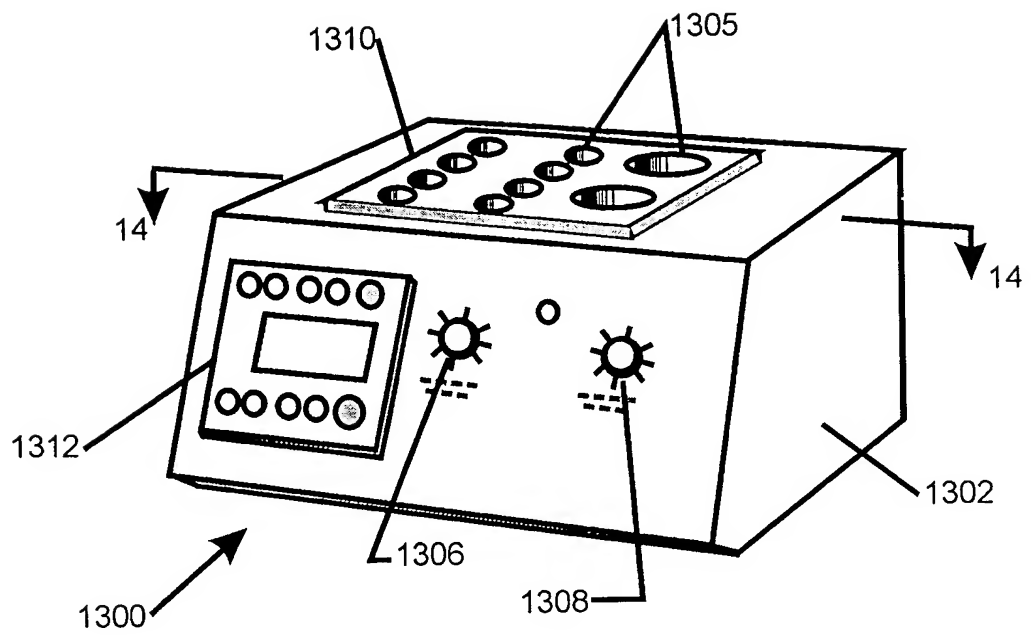
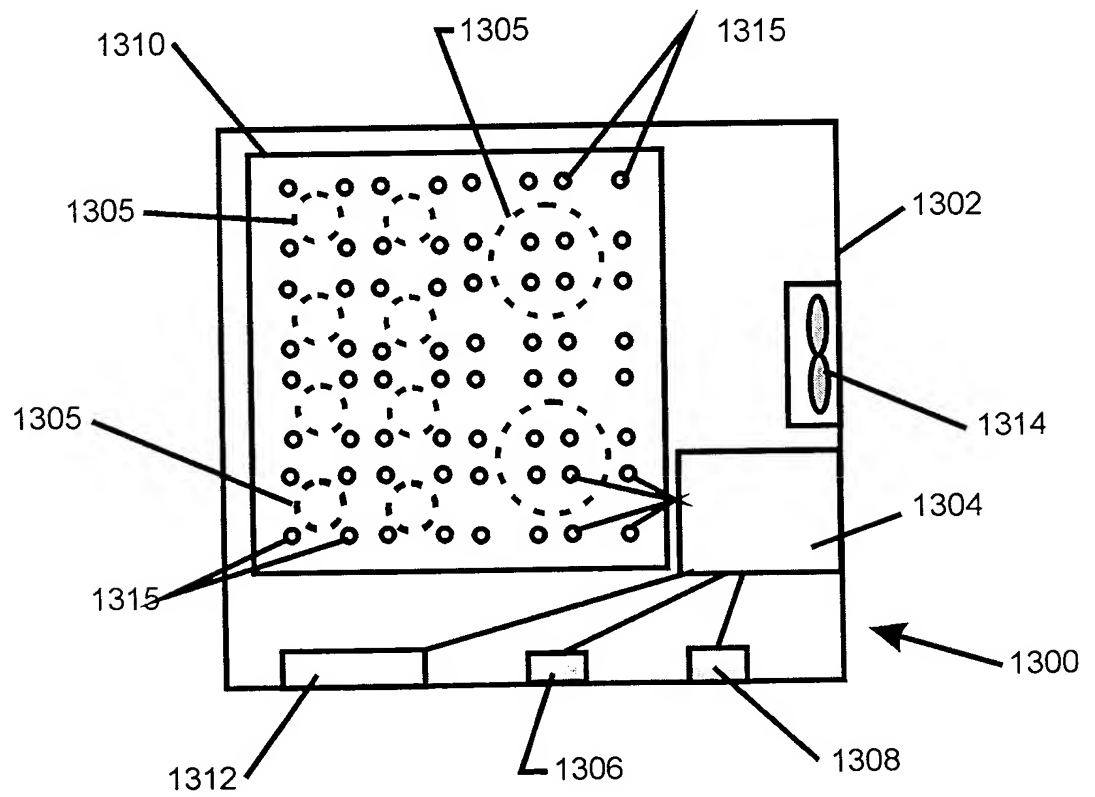


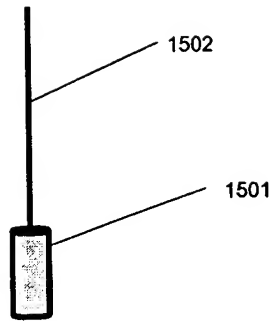
FIGURE 12



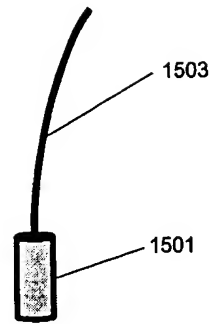
**FIG. 13**



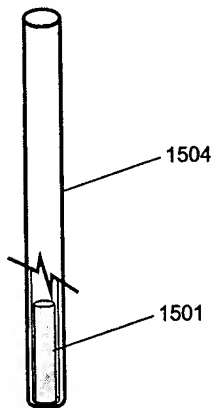
**FIG. 14**



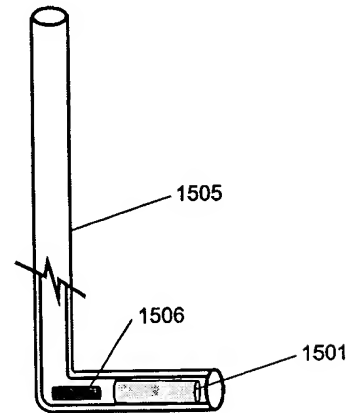
**FIGURE 15A**



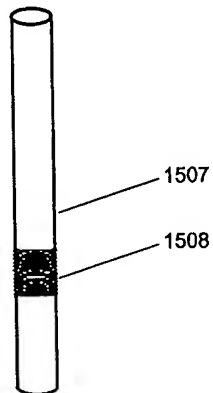
**FIGURE 15B**



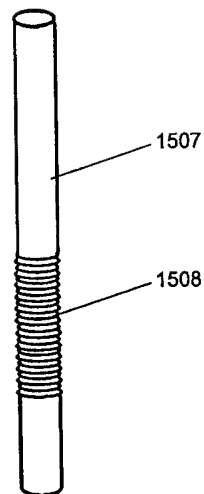
**FIGURE 15C**



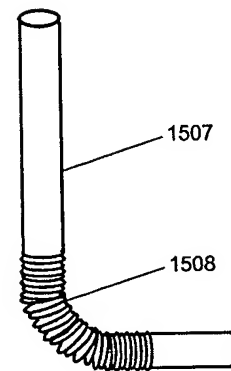
**FIGURE 15D**



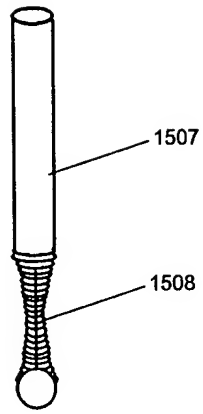
**FIGURE 15E**



**FIGURE 15F**



**FIGURE 15G**



**FIGURE 15H**